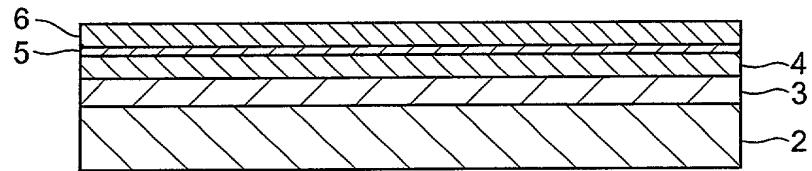
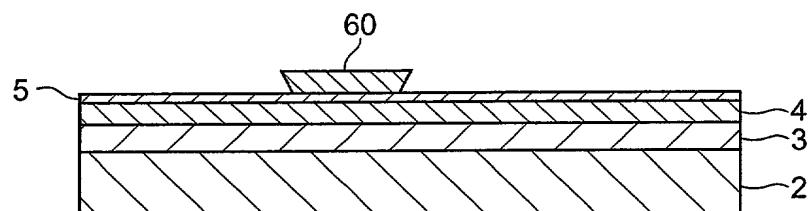
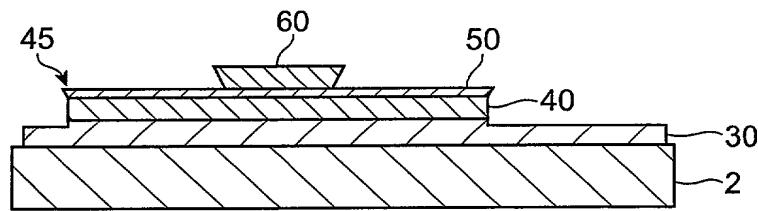
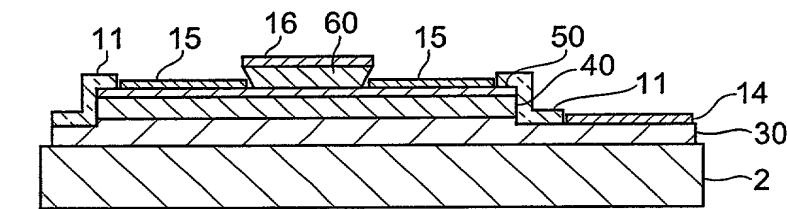
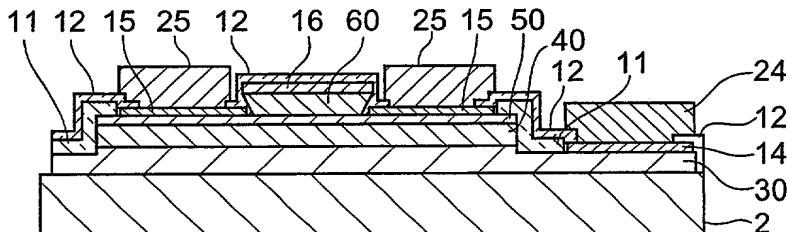
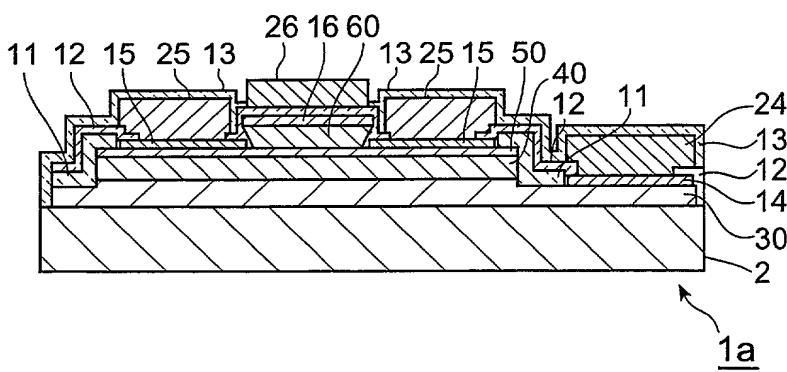
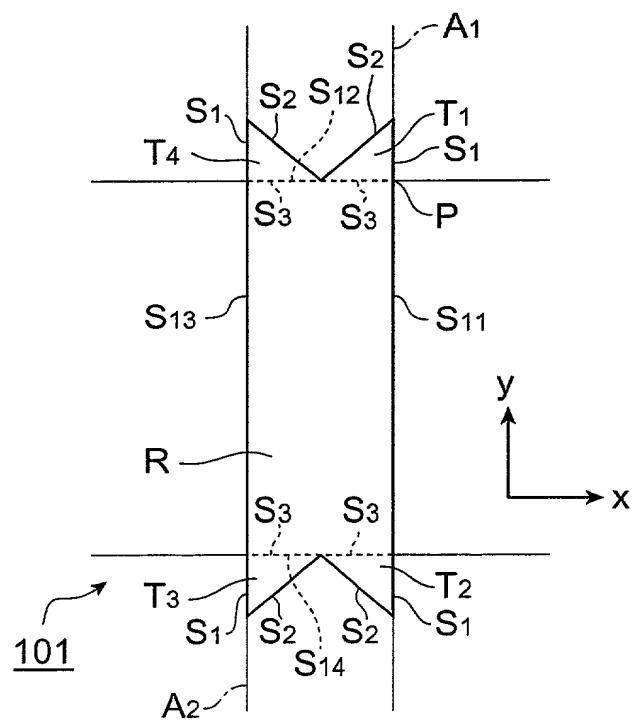


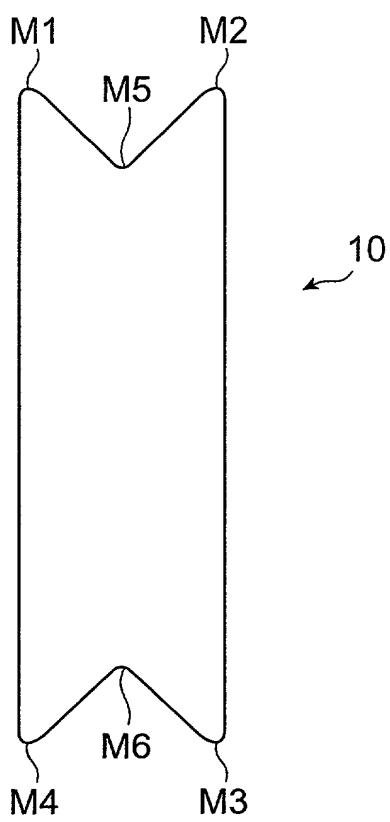
**Fig. 1A****Fig. 1B****Fig. 1C****Fig. 1D****Fig. 1E****Fig. 1F**

**Fig.2**

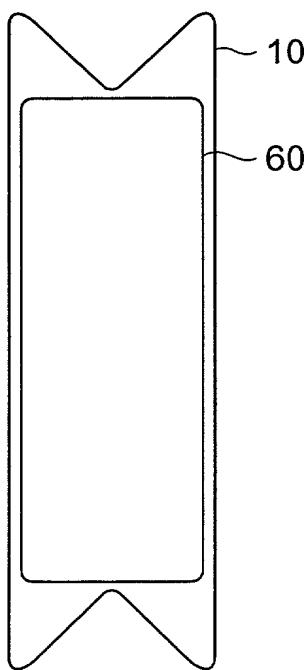
FILM NAME	MATERIALS	CONDUCTIVE TYPE	DOPANT	CARRIER CONCENTRATION ( $\text{cm}^{-3}$ )	FILM THICKNESS (nm)
EMITTER FILM 6	InP	n	Si	$4\sim 20 \times 10^{18}$	250
BASE FILM 5	InGaAs	p <sup>+</sup>	Zn	$4 \times 10^{19}$	50
COLLECTOR FILM 4	InGaAs	n	Si	$5 \times 10^{16}$	500
SUBCOLLECTOR FILM 3	InGaAs	n <sup>+</sup>	Si	$1 \times 10^{19}$	300

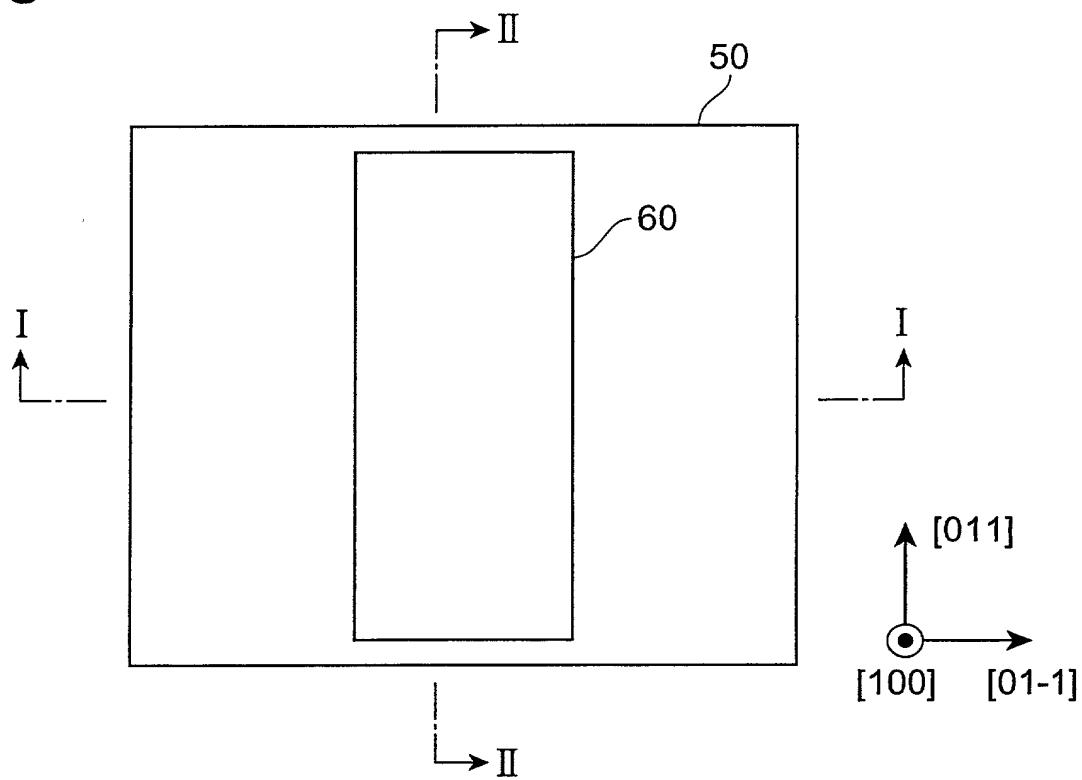
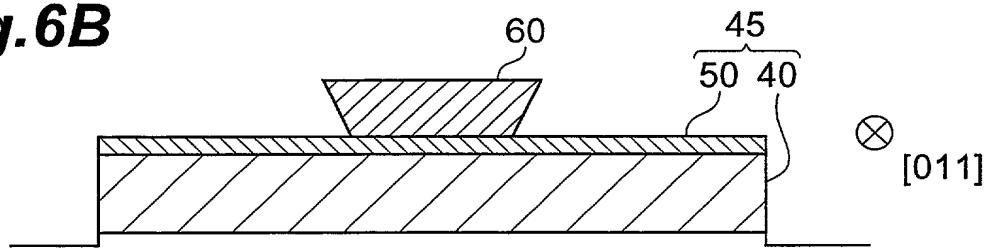
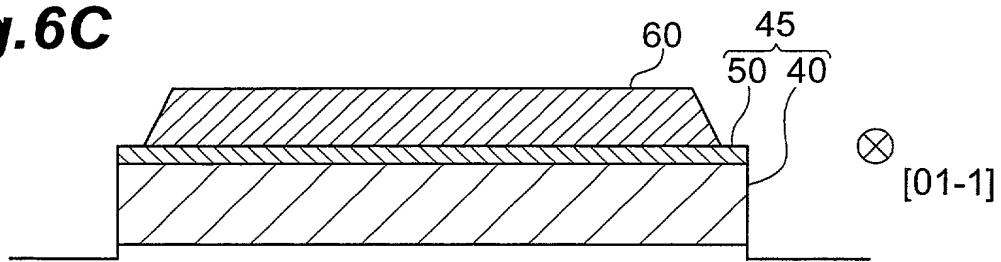
**Fig.3**

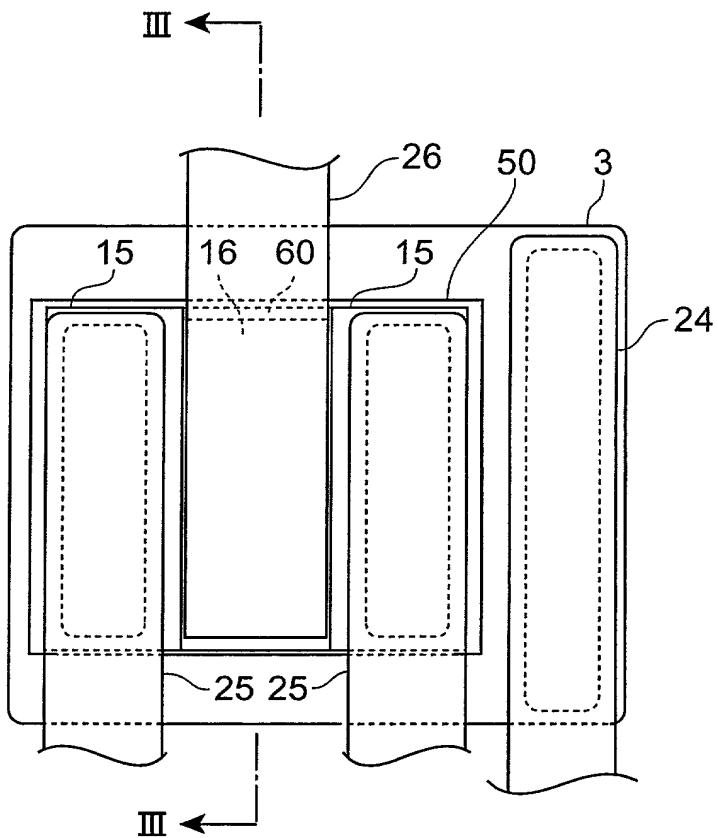
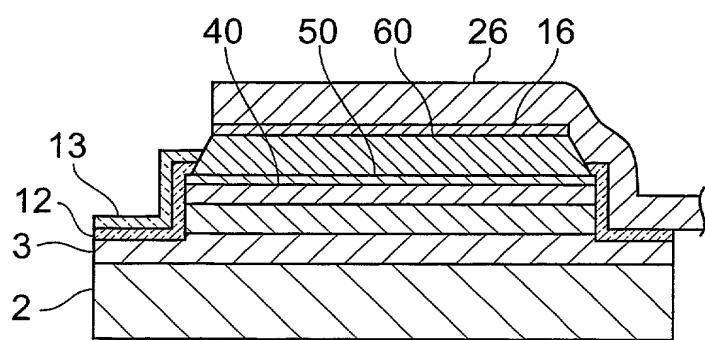
**Fig.4**

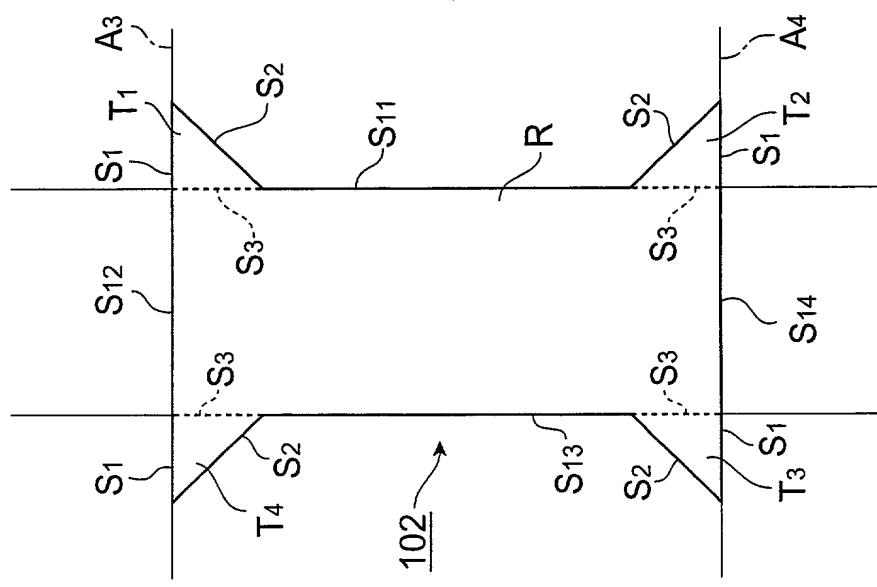
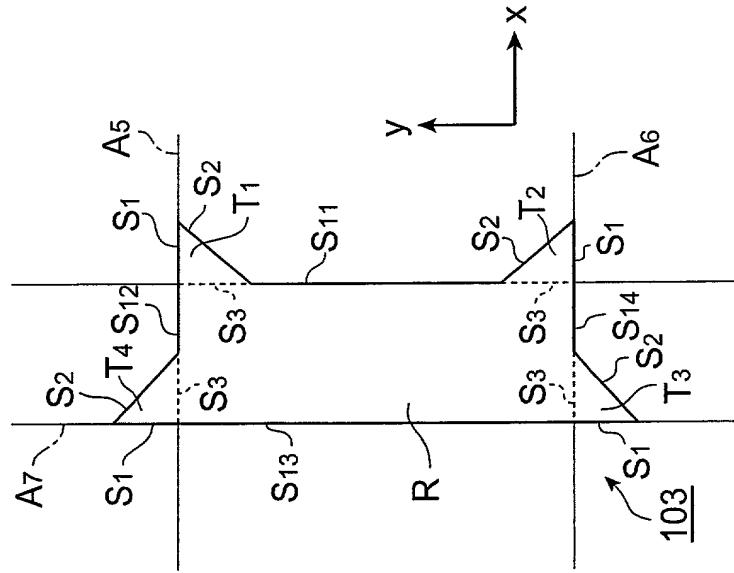


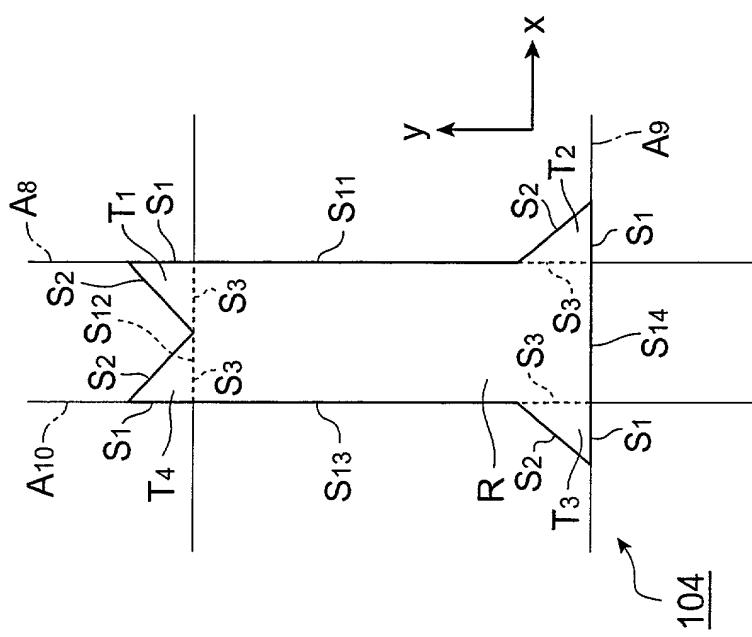
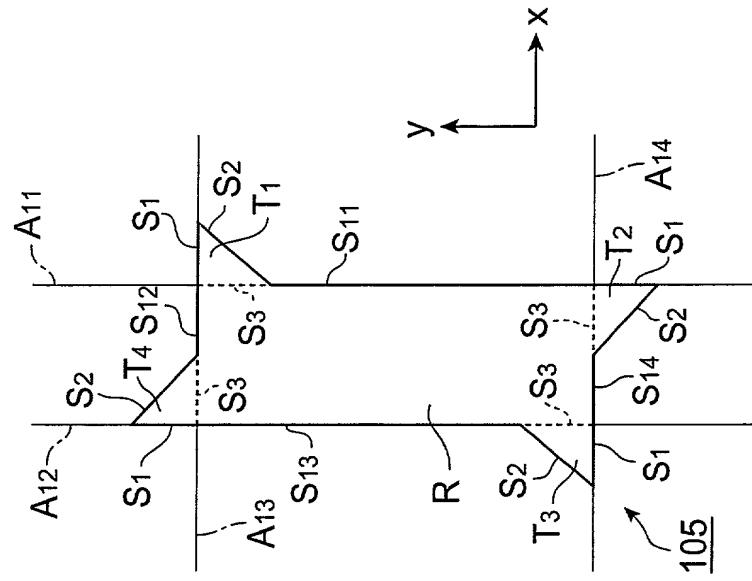
**Fig.5**

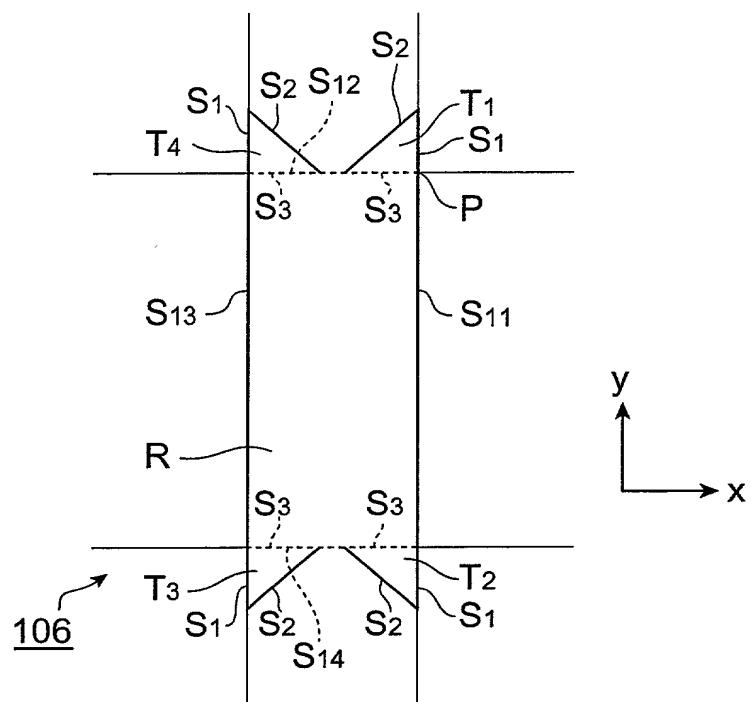


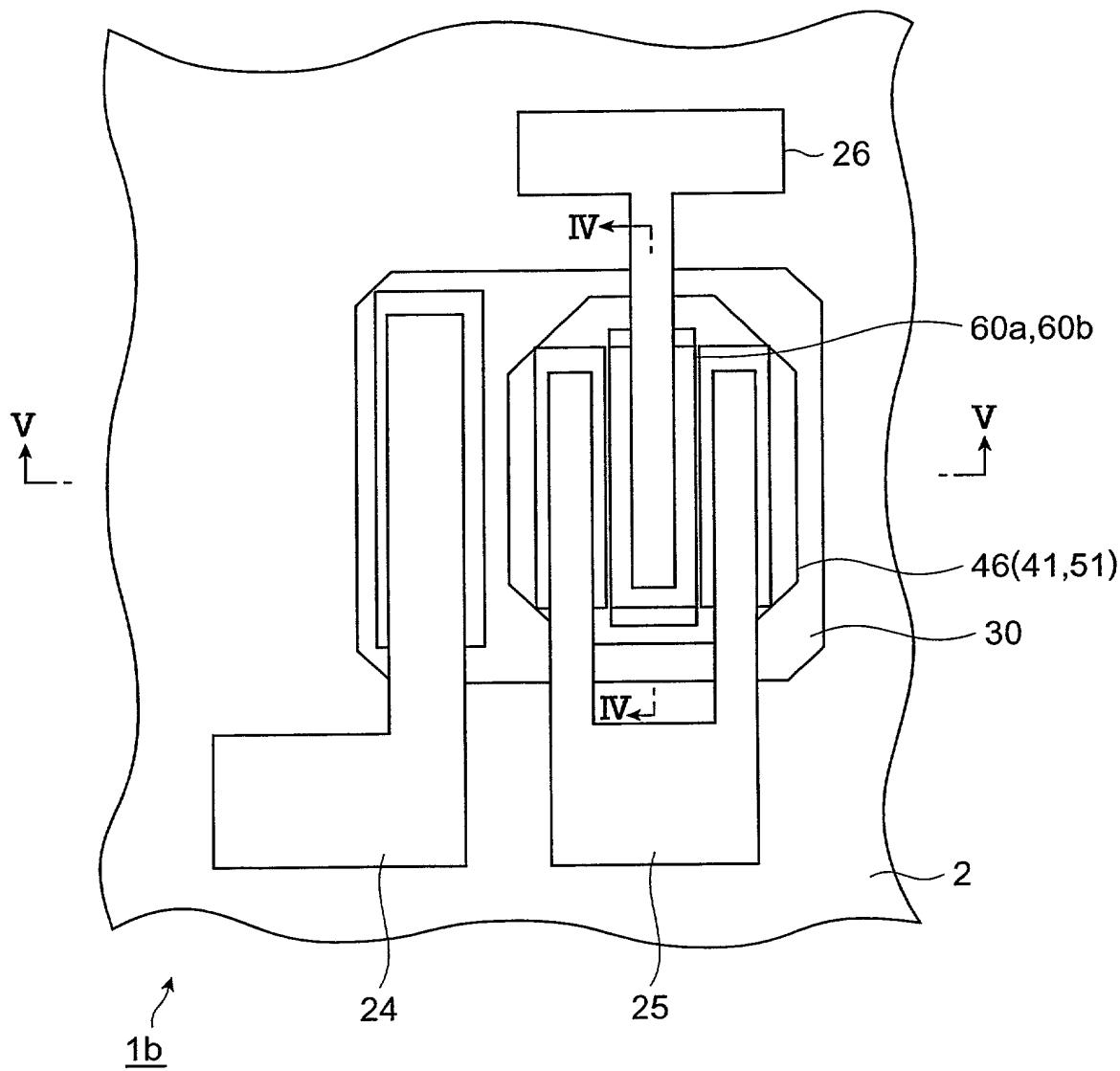
**Fig.6A****Fig.6B****Fig.6C**

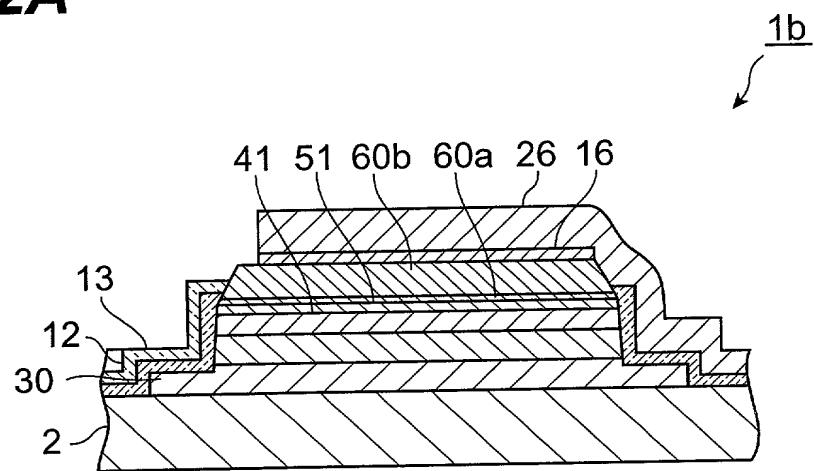
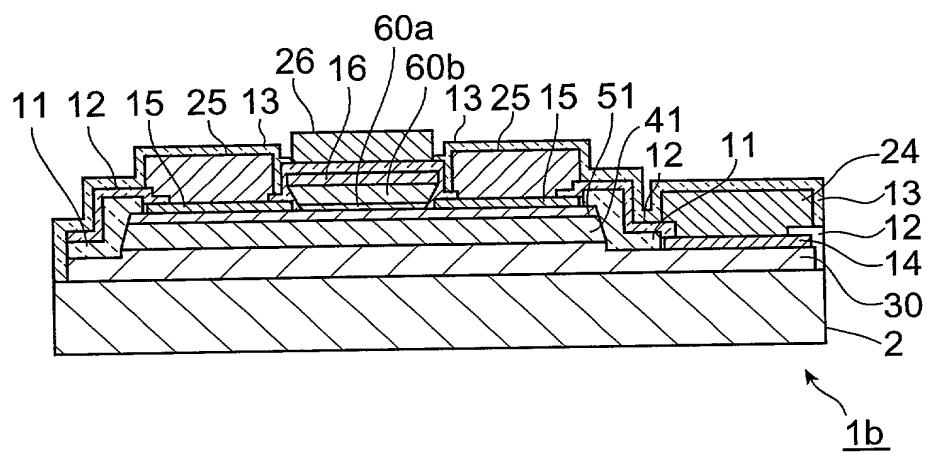
**Fig.7A****Fig.7B**

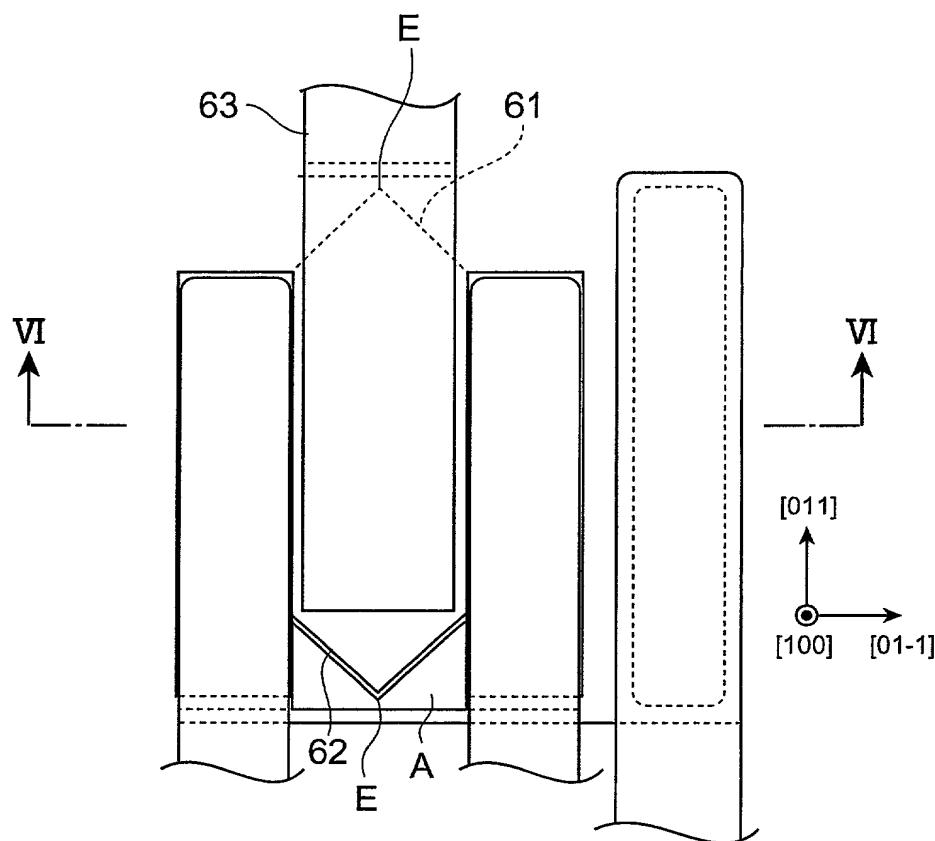
**Fig. 8A****Fig. 8B**

**Fig. 9A****Fig. 9B**

**Fig.10**

**Fig.11**

**Fig.12A****Fig.12B**

**Fig.13A****Fig.13B**